

midnight. The wind veered to west and attained its greatest force after the barometer began to rise."

By the 20th the centre of disturbance had reached N. 50°, W. 45°, having moved northeastward at no great distance from the Newfoundland coast; on this date the s. s. "Circassian," W. Richardson, commanding, had a heavy s. gale, hauling to w., with torrents of rain and very high sea, in N. 50° 10', W. 44° 0', and moderate to strong s. gales were reported to the eastward as far as the thirtieth meridian.

On the 22d the depression was shown near N. 52°, W. 25°; the s. s. "Wandrahm," N. J. Hundewadt, commanding, had a heavy gale from wsw. to sw. and nw., in N. 47° 30', W. 27° 10', lowest barometer reading 29.55 (750.6), and other vessels, between W. 25° and 15°, had moderate to strong s. gales, with barometer ranging from 29.46 (748.3) to 29.9 (759.4). A rapid increase had occurred in the barometric gradient to the westward of thirtieth meridian, so that strong nw. gales prevailed over that region.

By the 23d the depression had either filled in or moved with greatly increased pressure toward the northern coast of the British Isles.

6.—This area is a continuation of the disturbance described as low area vii. under "Areas of low barometer." During the 25th, the depression passed northeastward along the coast of Nova Scotia and over Newfoundland, and on the 26th it was to the northward of 50° N., and between W. 40° and 50°. The barometer ranged from 29.7 (744.4) to 29.9 (759.4), with strong breezes to gales from w. and sw. over the region between N. 45° and 50°, and from the eastern coast of Newfoundland to the fortieth meridian. By the 27th, the disturbance had disappeared.

7.—This disturbance occupied mid-ocean during the closing days of the month; on the 29th, there was a decrease of about .3 inch over the region north of the forty-fifth parallel, and from W. 40° eastward to W. 20°; until the close of the month, the pressure over the above region ranged from 29.23 (742.4) to 29.7 (754.4).

### TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

The distribution of mean temperature over the United States and Canada for December, 1884, is exhibited on chart ii. by the dotted isothermal lines; and in the table of miscellaneous data are given the monthly means for the various stations of the Signal Service.

In the following table are given the averages for the several geographical districts with the normals and departures, as deduced from the Signal Service observations:

Average temperatures for December, 1884.

Districts.	Average for Dec., Signal-Service ob- servations.		Comparison of Dec., 1884, with the average for several years.
	For sev- eral years.	For 1884.	
New England.....	30.4	31.9	+ 1.5
Middle Atlantic states.....	36.7	38.1	+ 1.4
South Atlantic states.....	48.5	50.4	+ 1.9
Florida peninsula.....	62.1	64.0	+ 1.9
Eastern Gulf states.....	50.3	51.3	+ 1.0
Western Gulf states.....	50.5	48.9	- 1.6
Rio Grande valley.....	60.4	59.1	- 1.3
Tennessee.....	41.7	41.2	- 0.5
Ohio valley.....	35.4	34.3	- 1.1
Lower lake region.....	28.8	28.7	- 0.1
Upper lake region.....	24.6	22.9	- 1.7
Extreme northwest.....	11.1	5.2	- 5.9
Upper Mississippi valley.....	28.3	24.3	- 3.9
Missouri valley.....	23.7	14.2	- 9.5
Northern slope.....	23.6	8.5	- 15.1
Middle slope.....	30.9	21.5	- 9.4
Southern slope.....	35.3	44.1	+ 8.8
Southern plateau.....	44.3	44.0	- 0.3
Middle plateau.....	31.3	34.4	+ 3.1
Northern plateau.....	32.9	19.5	- 13.4
North Pacific coast region.....	41.2	33.7	- 7.5
Middle Pacific coast region.....	48.3	49.6	+ 1.3
South Pacific coast region.....	55.3	53.1	- 2.2
Mount Washington, N. H.....	8.9	11.9	+ 3.0
Pike's Peak, Colo.....	6.5	5.4	- 1.1

On chart iv. the deviations from the normal temperatures are graphically exhibited by dotted lines connecting stations of equal departures.

In the districts on the Atlantic and Gulf coasts, in the middle plateau and middle Pacific coast region, the mean temperature for December has been above the normal, the stations reporting the greatest departures being as follows: Kitty Hawk, North Carolina, +3°.6; Barnegat City, New Jersey, +3°.5; New Orleans, Louisiana, +3°.4; Wilmington, North Carolina, and Salt Lake City, Utah Territory, +3°.3; Portland, Maine, Augusta, Georgia, and Winnemucca, Nevada, +3°.2.

In Texas and over the interior and northwestern portions of the country the mean temperature for the month has been below the normal, the departures being unusually large from the upper Mississippi valley westward to the Pacific coast; at stations in Montana the mean temperatures varied from 15° to 23°.3 below the normal.

### DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for the various districts; in the table of miscellaneous data, and on chart iv. The following notes in connection with this subject are reported by voluntary observers:

*Arkansas*.—Lead Hill, Boone county: mean temperature, 29°.1 is 11°.4 below the December average for the last three years.

*Dakota*.—Webster, Day county: mean temperature, 9°.1, is 5°.6 below the December average for the two preceding years.

*Illinois*.—Mattoon, Coles county: mean temperature, 28°.5, is 2°.1 below the December average for the last four years.

Swanwick, Perry county: mean temperature, 29°.2, is 4°.7 below the December average for the last two years.

Riley, McHenry county: mean temperature, 19°.4, is 2°.4 below the December mean for the last twenty-three years.

Peoria, Peoria county: mean temperature, 27°.3, is 1°.4 below the December average for the last thirty years.

Sycamore, DeKalb county: mean temperature, 20°.5, is 7°.0 below the December average for the last three years.

*Indiana*.—Vevay, Switzerland county: mean temperature, 34°.0, is 0°.7 below the December average for the last twenty-one years.

Wabash, Wabash county: mean temperature, 26°.0, is 3°.9 below the December average of the last eight years.

Spiceland, Henry county: mean temperature, 27°.2, is 2°.0 below the December average for the last thirty-one years.

*Iowa*.—Dr. Gustavus Hinrichs, director of the State Weather Service, Iowa City, reports the mean temperature for the month to have been 5° below the normal.

*Kansas*.—Independence, Montgomery county: mean temperature, 25°.4, is 6° below the December average for the last thirteen years.

Emporia, Lyon county: mean temperature, 22°.4, is 7°.4 below the normal; it was 9°.5 below the December average for the four preceding years.

Lawrence, Douglas county: mean temperature, 23°.5, is 6°.3 below the December average for the last sixteen years.

Wellington, Sumner county: mean temperature, 23°.1, is 6°.9 below the December average for the last six years.

*Maine*.—Gardiner, Kennebec county: mean temperature, 26°.8, is 4°.4 above the December average for the last forty-nine years.

*Maryland*.—Fallston, Harford county: mean temperature, 34°.0, is 0°.9 above the December average for the last nine years.

*Missouri*.—Saint Louis: mean temperature, 29°.8, is 3°.6 below the December normal.

*New Hampshire*.—Contoocook, Merrimack county: mean temperature, 27°.9, is nearly 4°.5 above the December average.

*New Jersey*.—South Orange, Essex county: mean temperature, 33°.9, is 3°.7 above the December average for the last fifteen years.

Table of comparative minimum temperatures for the month of December.

State or Territory.	Minimum for December, 1884, Signal Service.			Minimum since Signal-Service stations were opened—3 to 13 years.			Lowest from any other source.			
	Station.	Temperature.		Station.	Temperature.	Year.	Place.	Temperature.	Year.	Length of record.
Alabama	Montgomery	16.0		Montgomery	8	1880	Huntsville	-7		Years.
Do	Mobile	20.3		Mobile	14	1880	Mobile	14		9
Arizona	Fort Apache	5.0		Fort Apache	2	1879	Fort Canby (old)	-25	1855	31
Do	Fort Verde	7.0		Prescott	-18	1879	Fort Whipple	-9		12
Arkansas	Little Rock	13.0		Little Rock	18	1880	Washington (near)	0	1845	10
Do	Fort Smith	12.2		Fort Smith	9.5	1882	Fort Smith	0		27
California	Red Bluff	25.0		Red Bluff	25	1882, 1883	Fort Jones	-17	1855, 1857	21
Do	San Francisco	40.0		San Francisco	34	1879	Camp Bidwell	-10		5
Colorado	Denver	5.0		Denver	25	1879	Fort Garland	-30		11
Do	Pike's Peak	-20.0		Pike's Peak	-37	1878	Fort Lyon	-30	1876	39
Connecticut	New London	-5.2		New London	1	1875, 1880	Middletown	-18	1860	20
Do	New Haven	-9.5		New Haven	4	1880	New Haven	-11		11
Dakota	Fort Buford	-39.8		Fort Buford and Stevenson	-40	1879	Fort Stevenson	-54	1879	87
Do	Fort Bennett	-41.3		Fort Bennett	-59	1879	Fort Totten	-51	1879	7
Delaware	Delaware Breakwater	8.9		Delaware Breakwater	1	1880	Fort Delaware	9		44
District of Columbia	Washington City	6.1		Washington City	-13	1880	Washington City	-10		48
Florida	Pensacola	23.0		Pensacola	17	1880	Fort Barrancas	15		52
Do	Key West	62.0		Key West	44	1876	Key West	48		43
Georgia	Atlanta	11.0		Atlanta	1	1880	McPherson Barracks	-1	1880	7
Do	Augusta	23.0		Augusta	7	1880	Augusta Arsenal	10		48
Idaho	Lewiston	-6.0		Lewiston	-16	1879	Fort Hall	-30	1879	10
Do	Boise City	-7.3		Boise City	-10	1881	Fort Lapwai	-15	1865	10
Illinois	Springfield	-8.8		Springfield	-14	1880	Rock Island Arsenal	-20		14
Do	Chicago	-11.2		Chicago	-15	1880	Chicago	-20		38
Indiana	Indianapolis	-12.3		Indianapolis	-15	1876	Wabash	-18	1880	6
Do							Spiceland	-18	1880	20
Indian Territory				Fort Sill	2	1879, 1880	Fort Sill	-11		10
Iowa	Davenport	-9.8		Davenport	-17	1876	Cresco	-35	1879	8
Do	Dubuque	-17.1		Dubuque	-19	'76, '79, '80	Dubuque	-23		11
Kansas	Dodge City	-11.8		Dodge City	-15	1876	Fort Wallace	-24	1876	8
Do	Leavenworth	-6.0		Leavenworth	-14	1880	Fort Leavenworth	-19		50
Kentucky	Louisville	-5.0		Louisville	-7	1880	Newport Barracks	-8		28
Louisiana	Shreveport	19.6		Shreveport	10	1880	Oskaloosa	10	1880	3
Do	New Orleans	28.8		New Orleans	20	1880	New Orleans	19		51
Maine	Eastport	-21.0		Eastport	-20	1875	Gardiner	-24		45
Do	Portland	-6.1		Portland	-12	1875	Portland	-13		38
Maryland	Baltimore	8.6		Baltimore	-3	1880	Emmitsburg	-19	1880	7
Do							Baltimore	4		36
Massachusetts	Boston	-9.5		Boston	-11	1875	Billerica	-20	1876	8
Do	Thatcher's Island	-7.2		Springfield	-10	1875	Williamstown	-19		55
Michigan	Escanaba	-14.1		Escanaba	-23	1880	Fort Brady	-41		58
Do	Detroit	-6.1		Detroit	-11	1880	Detroit	-13		34
Minnesota	Saint Vincent	-47.8		Saint Vincent	-42	1880	Fort Ripley	-40		14
Do	Saint Paul	-27.0		Saint Paul	-39	1879	Fort Snelling	-34		62
Mississippi	Vicksburg	18.1		Vicksburg	12	1880	Vicksburg	17	1868	3
Do							Fayette	11	1880	8
Missouri	Saint Louis	-7.0		Saint Louis	-15	1880	Rolla (near)	-23	1870	7
Do				Springfield	-4	1882	Saint Louis	-7		38
Montana	Fort Benton	-56.5		Fort Benton	-59	1880	Fort Benton	-52	1880	14
Do	Fort Assinaboine	-50.0		Fort Assinaboine	-42	1880	Camp Baker	-53	1871	9
Nebraska	Omaha	-17.0		Omaha	-17	1879	Sydney Barracks	-37	1879	5
Do	North Platte	-18.0		North Platte	-27	1879	Glendale	-30	1868	2
Nevada	Winnemucca	0.0		Winnemucca	-20	1879	Fort Halleck	-22	1879	12
New Hampshire	Mount Washington	-42.0		Mount Washington	-47	1876	Dartmouth College	-29		18
New Jersey	Sandy Hook	0.8		Sandy Hook	-7	1880	Linden	-18	1880	6
Do	Barnegat City	0.2		Barnegat City	-7	1880	Paterson	-6	1880	15
New Mexico	Santa Fé	2.0		Santa Fé	-13	1879	Fort Union	-28	1855	30
New York	Albany	-15.9		Albany	-17	1875	Madison Barracks	-44	1871	54
Do	Rochester	-10.5		Rochester	-8	1875, 1880	Rochester	-9		40
North Carolina	Charlotte	11.0		Charlotte	-5	1880	Lenoir	-16	1880	8
Do	Kitty Hawk	14.7		Kitty Hawk	8	1880	Fort Johnson	9		54
Ohio	Sandusky	-11.3		Sandusky	-13	1880	Kenton	-20	1876	3
Do	Columbus	-7.9		Cleveland and Columbus	-12	1880	College Hill	-12	1880	65
Oregon	Roseburg	19.2		Roseburg	7	1879	Eola	-8	1879	7
Do	Portland	12.0		Portland	3	1879	Fort Dalles	-6		16
Pennsylvania	Erie	5.9		Erie	-11	1880	Lewisburg	-23	1865, 1867	6
Do	Philadelphia	0.8		Philadelphia	-5	1880	Philadelphia	3		123
Rhode Island	Block Island	-3.2		Newport	-3	1875	Providence	-12		36
South Carolina	Charleston	26.0		Charleston	13	1880	Aiken	3	1880	7
Do							Charleston	20		104
Tennessee	Nashville	0.9		Nashville	-2	1876	Clarkeville	-4	1880	8
Do	Knoxville	5.2		Knoxville	-5	1880	Humboldt	-3		4
Texas	Fort Stockton	13.8		Fort Stockton	8	1880	Camp Stockton	-9	1859	15
Do	Fort Elliott	-2.0		Fort Elliott	-10	1879	Fort Griffin	-7	1870	4
Utah	Salt Lake City	6.6		Salt Lake City	-10	1879	Fort Crittenden	-22	1859	3
Do							Camp Douglas	-8	1879	20
Vermont				Burlington	-19	1879	Lunenburg	-30	1868	20
Virginia	Lynchburg	5.5		Lynchburg	-5	1880	Alexandria	12		11
Do	Norfolk	12.2		Norfolk	0	1880	Fortress Monroe	17		48
Washington Territory	Olympia	8.0		Olympia	8	1879	Fort Colville	-22		21
Do	Dayton	-26.0		Dayton	0.0	1880	Fort Townsend	-22	1872	15
West Virginia	Morgantown	-9		Morgantown	-9	1880	Flemington	-21	1880	2
Wisconsin	La Crosse	-26.0		La Crosse	-26	1879	Fort Howard	-38		31
Do	Milwaukee	-21.6		Milwaukee	-21	1880	Milwaukee	-19		12
Wyoming	Cheyenne	-13.4		Cheyenne	-24	1879, 1880	Fort Fetterman	-36		14
Do	Fort Bridger	-5.6		Fort Washakie	-27	1882	Fort Bridger	-28		16

**New York.**—North Volney, Oswego county: mean temperature, 26° 5, is 0° 9 above the December average for the last seventeen years.

**Palermo,** Oswego county: mean temperature, 23° 5, is 0° 9 below the December average for the last thirty-one years.

**Ohio.**—Wauseon, Fulton county: mean temperature, 24° 5, is 2° 2 below the December average for the last fourteen years.

**Pennsylvania.**—Dyberry, Wayne county: mean temperature, 27° 5, is 2° 5 above the December average for the last twenty years.

**Vermont.**—Woodstock, Windsor county: mean temperature, 21° 8, is 2° 2 above the December average for the last seven years.

**Virginia.**—Wytheville, Wythe county: mean temperature,

38° 3, is 3° 2 above the December average for a period of twenty years.

Variety Mills, Nelson county: mean temperature, 38° 1, is 1° 4 above the December average for the last eight years.

Washington Territory.—Bainbridge Island: mean temperature, 33°, is the lowest December average for the last seven years.

West Virginia.—Helvetia, Randolph county: mean temperature, 35° 8, is 2° 2 above the December average for the last eight years.

#### RANGES OF TEMPERATURE.

The monthly and daily ranges of temperature at the various Signal Service stations are shown in the table of miscellaneous meteorological data. The monthly ranges were unusually large in Montana, the following stations reporting ranges exceeding 100°: Poplar River, 100° 1; Fort Custer, 105° 5; Fort Shaw, 106° 7; Fort Assinaboine, 113° 8; Fort Benton, 125° 7.

The smallest monthly ranges are: 20° at Key West, Florida, and 24° at San Francisco, California.

#### LOW TEMPERATURES.

The following notes relating to the low temperatures of December, 1884, have been reported:

Colorado.—West Las Animas: on the 24th the temperature fell to -6° 6, and on the 31st it fell to -21° 5.

Dakota.—Fort Bennett: the minimum temperature of the 25th was -41° 3; the lowest previously recorded since 1880 was -42° in January, 1883.

Florida.—Pensacola, 19th: the first ice of the season formed on this date; the temperature fell to 23°, which is the lowest recorded since this station was opened in 1879, with one exception, viz.: 17° on December 30th, 1880.

Illinois.—Chicago: on the 18th the temperature remained below zero all day, the daily mean being -6° 6; on the morning of the 19th the lowest temperature recorded was -11° 2.

Iowa.—Des Moines: on the 18th the temperature did not rise above zero, and on the a. m. of the 19th the thermometer registered -18° 2, being the lowest that has been recorded in December since Signal Service observations were begun in 1878.

Maine.—Portland: intensely cold weather prevailed in the northern and central portions of the state on the 27th, the following temperatures being reported: from -22° to -26° at Buckfield, Canton, Farmington, Strong, and Waterville; and -35° at Farmington Falls.

Eastport: the minimum temperature, -21°, on the morning of the 20th, is the lowest recorded since the establishment of this station in 1874; in January, 1874, and December, 1875, the temperature fell to -20°, being the next lowest on the record.

Bangor: on the morning of the 20th thermometers in various localities in this vicinity showed temperatures ranging from -20° to -24°; at noon the temperature was about zero, and at night it had fallen to -10°; on the morning of the 21st it was -6°, and rose rapidly during the day. On the 27th temperatures varying from -10° to -15° were recorded, and reports from Holton, ninety miles north, state that the temperature fell to -35°.

Michigan.—Hudson: the night of the 17-18th was the coldest that has been experienced for the last fifteen years, the temperature falling to -28°.

Minnesota.—Saint Paul: on the 25th the temperature was stationary at -27° from 5.56 to 9.30 a. m. A self-registering thermometer attached to a wooden box and exposed on the roof of the building recorded a temperature of -36° 5.

Montana.—Fort Assinaboine: the minimum temperatures on the 24th and 25th, -47° 2 and -50° 0, are the lowest of which there is a record; mercury froze on the 22d, 24th, and 25th.

Fort Benton: the minimum temperature on the 24th, -56° 5, is, with the exception of -59° in 1880, the lowest on the records of this office.

In the following table are shown the daily extremes and the mean temperatures at the coldest stations in Minnesota, Dakota, and Montana. As the cold weather set in about the middle of the month, the means for the first fifteen days and for the last sixteen days of the month are given separately. A comparison of the means for the first and second portions of the month shows remarkable ranges, varying from 32° 8 at Fort Totten to 43° 8 at Fort Benton:

Dates.	Fort Assinaboine, Mont.			Fort Benton, Mont.			Fort Custer, Mont.			Fort Shaw, Mont.		
	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.
1.....	63.8	44.4	38.9	69.2	36.1	43.2	54.1	29.3	34.7	62.2	45.3	38.8
2.....	51.4	31.1	35.2	69.2	27.9	39.6	58.0	26.2	38.2	52.5	36.8	36.8
3.....	50.1	33.7	35.2	53.8	37.2	41.0	55.7	34.9	38.1	50.0	32.0	34.2
4.....	45.4	32.3	33.5	50.8	29.2	36.7	49.7	34.3	35.4	46.0	28.5	32.7
5.....	45.3	29.6	33.0	47.2	35.4	38.1	52.0	24.1	32.7	46.0	33.5	42.2
6.....	38.4	19.8	24.3	37.5	20.8	24.7	40.1	24.0	26.6	33.5	20.0	26.0
7.....	32.0	13.6	23.2	32.2	10.1	21.5	33.1	17.8	21.0	29.0	6.5	19.2
8.....	40.8	27.2	31.4	39.9	24.2	27.1	42.8	8.0	21.8	35.5	26.2	24.5
9.....	39.8	19.7	28.5	39.3	20.1	24.2	39.3	14.0	26.0	35.0	23.5	25.0
10.....	37.2	10.9	21.0	41.6	11.5	18.6	36.7	18.8	23.2	34.0	8.7	15.8
11.....	22.3	9.1	15.4	17.8	4.3	10.7	27.8	9.1	16.2	17.0	6.0	13.2
12.....	21.6	11.7	17.2	19.2	12.2	12.9	18.9	9.0	13.7	18.0	13.0	13.8
13.....	19.5	10.9	15.3	16.5	5.2	8.5	22.2	12.9	15.6	14.5	0.5	4.8
14.....	15.8	-10.8	1.1	11.0	-7.2	2.3	17.0	2.8	10.0	10.5	-6.5	1.2
15.....	-7.9	-21.2	-13.0	-4.5	-22.2	-13.8	5.0	-20.0	-13.8	-6.5	-28.0	-17.1
Means.....	34.4	17.5	22.7	36.1	16.3	22.4	36.8	16.3	22.6	31.8	16.3	20.1
16.....	-3.4	-27.0	-11.7	-9.3	-25.9	-15.1	-4.0	-27.0	-14.1	-16.5	-29.8	-22.6
17.....	-7.0	-25.0	-16.2	-1.8	-20.9	-11.0	1.0	-16.0	-7.0	-3.5	-20.8	-10.7
18.....	-7.7	-27.1	-12.8	-7.3	-16.1	-11.3	0.0	-12.0	-5.3	-6.5	-15.5	-10.3
19.....	-3.6	-15.3	-8.4	0.2	-12.8	-6.9	1.0	-5.9	-2.6	-6.5	-10.5	-8.8
20.....	-8.7	-29.5	-17.6	-6.8	-30.1	-20.7	0.8	-16.0	-8.7	-7.5	-34.0	-21.0
21.....	-17.7	-32.3	-24.3	-12.6	-31.8	-26.7	5.0	-20.0	-15.3	-15.0	-34.0	-28.3
22.....	-21.1	-42.2	-29.4	-24.5	-47.5	-34.8	-13.7	-24.9	-17.7	-19.0	-41.0	-28.0
23.....	-13.9	-28.9	-20.9	-14.9	-39.5	-27.7	-13.3	-39.0	-26.0	-15.0	-39.0	-25.4
24.....	-25.0	-47.2	-36.8	-29.2	-56.5	-44.3	-24.2	-47.5	-36.6	-24.0	-44.5	-32.9
25.....	-7.8	-50.0	-20.4	-4.5	-47.6	-20.7	1.5	-36.0	-16.2	-30.5	-44.0	-2.7
26.....	-1.0	-13.0	-3.3	1.5	-11.4	-5.2	3.0	-7.9	-0.8	-1.5	-8.0	-6.1
27.....	1.6	-18.4	-8.4	0.2	-24.5	-11.2	3.1	-7.0	0.4	-2.0	-25.0	-14.7
28.....	-11.0	-37.5	-19.0	-10.1	-37.4	-23.7	2.1	-15.0	-10.2	-14.0	-28.0	-20.0
29.....	-11.0	-28.5	-15.7	-11.5	-35.4	-24.8	-11.0	-26.0	-18.9	-14.0	-26.5	-21.7
30.....	-13.0	-38.9	-25.2	-16.2	-40.2	-30.1	-3.5	-25.0	-14.8	-12.0	-28.0	-22.8
31.....	-18.4	-46.6	-26.9	-17.6	-49.2	-28.2	-13.5	-34.0	-22.7	-6.0	-25.0	-11.4
Means.....	-10.5	-31.7	-18.6	-10.3	-32.7	-21.4	-5.0	-22.1	-13.6	-8.3	-27.1	-18.0
Dates.	Poplar River, Mont.			Fort Buford, Dak.			Fort Totten, Dak.			Saint Vincent, Minn.		
	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.
1.....	50.9	29.4	36.4	56.8	32.7	38.3	42.1	27.5	34.1	36.5	17.8	27.1
2.....	49.9	25.1	34.6	48.4	28.6	37.0	43.0	31.0	35.7	44.8	26.2	35.4
3.....	48.9	26.7	35.8	46.4	29.7	35.6	41.0	26.3	32.2	44.8	30.8	33.6
4.....	45.8	26.0	33.8	41.1	28.9	31.9	38.0	20.3	28.9	37.7	16.2	27.0
5.....	48.3	22.9	30.9	41.8	27.5	32.5	41.2	22.8	32.5	38.7	18.8	29.0
6.....	29.9	18.9	24.0	39.9	25.1	26.8	36.0	26.0	28.2	34.5	26.3	28.8
7.....	18.9	0.1	13.4	26.0	11.2	15.7	28.8	16.0	22.1	30.6	18.0	24.2
8.....	37.4	9.6	21.2	37.5	12.1	28.2	21.5	4.0	13.0	28.7	3.9	12.6
9.....	34.3	14.9	25.1	37.1	23.8	29.3	35.0	6.5	24.8	31.3	0.9	20.9
10.....	29.5	15.9	20.7	30.0	13.0	17.4	28.5	2.5	12.2	29.1	13.1	16.9
11.....	18.8	-1.9	4.0	18.1	0.0	3.5	13.0	-3.0	6.4	16.7	5.0	9.5
12.....	10.4	-11.2	-0.1	8.8	1.0	5.3	9.0	3.0	6.2	14.1	3.9	9.6
13.....	19.6	5.1	11.8	22.2	8.1	12.9	21.0	1.0	12.4	21.7	0.4	11.5
14.....	6.4	-11.3	-2.3	12.4	-7.5	1.8	18.0	-7.2	0.8	19.4	-9.4	0.0
15.....	-10.5	-22.8	-16.8	-7.0	-17.0	-14.0	-6.1	-21.0	-16.2	-8.2	-20.0	-15.0
Means.....	29.4	10.0	18.2	30.7	14.5	20.1	27.3	10.4	18.2	28.0	10.1	18.1
16.....	-6.9	-22.7	-15.9	-5.5	-18.5	-11.0	-9.0	-20.5	-13.4	-6.3	-22.3	-14.4
17.....	-12.8	-33.3	-21.1	-5.5	-26.3	-18.0	-9.0	-28.0	-21.0	-12.2	-27.4	-23.9
18.....	-10.0	-40.3	-23.0	-9.9	-30.0	-18.5	-14.0	-34.0	-22.3	-19.2	-30.2	-24.0
19.....	-2.5	-12.3	-4.1	1.2	-11.8	-3.2	1.0	-24.4	-6.2	-0.8	-25.8	-6.5
20.....	-3.6	-21.1	-18.2	2.2	-19.5	-10.5	3.0	-19.0	-9.2	6.2	-16.7	-5.0
21.....	-15.5	-39.4	-27.6	-8.7	-34.0	-24.1	-11.8	-28.5	-18.4	-12.5	-27.4	-18.2
22.....	-28.3	-49.2	-35.5	-18.8	-39.8	-28.0	-25.0	-34.5	-28.7	-19.5	-38.2	-32.4
23.....	-21.1	-31.9	-27.7	-15.8	-30.6	-24.3	-20.0	-34.0	-23.9	-22.0	-47.8	-35.8
24.....	-27.8	-45.1	-38.7	-19.6	-39.3	-27.9	-21.0	-34.0	-25.5	-12.1	-42.8	-26.6
25.....	-5.0	-49.2	-21.1	-4.3	-39.1	-13.7	-4.0	-29.5	-12.1	-8.8	-35.9	-20.3
26.....	-5.2	-20.7	-13.0	1.5	-10.0	-6.3	3.5	-9.6	0.4	7.8	-10.0	-1.4
27.....	-2.8	-14.3	-9.6	4.8	-12.1	-4.7	12.0	-2.3	5.1	14.0	-7.5	2.2
28.....	-14.3	-30.2	-23.9	-5.8	-18.4	-13.3	2.2	-6.0	1.6	7.2	-14.1	3.8
29.....	-14.8	-33.2	-25.8	-10.3	-26.1	-20.8	-2.6	-23.0	-13.0	0.2	-20.0	-11.3
30.....	-22.5	-39.1	-29.7	-15.5	-31.7	-23.6	-11.0	-22.0	-14.7	-8.9	-31.8	-20.0
31.....	-33.2	-44.6	-39.8	-24.8	-39.6	-34.5	-13.0	-35.0	-28.0	-12.8	-38.2	-30.7
Means.....	-14.0	-32.5	-23.6	-7.9	-26.6	-17.7	-7.5	-24.0	-14.6	-6.2	-27.3	-17.0

New York.—Rome, Oneida county: the temperature fell to -22° on the morning of the 20th.

Lyons, Wayne county: the 20th was the coldest day known

in this section for many years; at 4 a. m. the thermometer indicated  $-22^{\circ}$ .

Watertown, Jefferson county: the weather on the 20th and 21st, throughout northern New York, was the coldest known for many years. At this place the temperature fell to  $-28^{\circ}$  on the 20th, and to  $-38^{\circ}$  on the 21st; at other points in the county it fell to  $-40^{\circ}$ .

Oswego: the minimum temperature,  $-17^{\circ}.5$  on the 20th, is the lowest recorded since the opening of the signal office here, in 1871.

Rochester: the minimum temperature,  $-10^{\circ}.5$ , on the morning of the 20th is the lowest recorded in December since Signal Service observations were begun in 1871; lower temperature than the above has occurred in two instances only, viz:  $-12^{\circ}$  in January, 1873, and the same in February, 1875.

North Carolina.—Charlotte: weather very cold on the 19th; minimum temperature,  $11^{\circ}$ ; plants in the hot-houses were killed.

Fort Macon: on the 19th, the temperature fell to  $15^{\circ}.2$ ; on the 20th, ice was two inches thick.

Scott's Hill, 19th: weather very cold, minimum temperature,  $11^{\circ}$ .

South Carolina.—Charleston: the fountains and pumps in the city froze on the 19th.

Virginia.—Cape Henry: the minimum temperature on the 20th,  $15^{\circ}.3$ , is the lowest with two exceptions, viz:  $12^{\circ}$  in 1876 and  $7^{\circ}$  in 1880, that has been recorded since this station was opened in 1873.

Washington Territory.—Dayton: on the 31st the temperature fell to  $-26^{\circ}$ , being the lowest temperature yet recorded here; observations were begun in 1880.

Wisconsin.—La Crosse: minimum temperature on the 25th was  $-26^{\circ}$ , at 8 a. m.; this has been equalled in December in but an instance, viz: in 1876, since the station was established, in 1873.

Wyoming.—Cheyenne: on the afternoon of the 15th the temperature fell from  $32^{\circ}$  to  $-8^{\circ}$  in four hours, and on the 23d it fell from  $42^{\circ}$  at 2 p. m. to  $-12^{\circ}$  at 6 p. m.; a range of  $54^{\circ}$ . On the 16th the daily mean temperature was  $-7^{\circ}.0$ , the lowest being  $-13^{\circ}.4$ .

#### FROSTS.

Frosts occurred in the various districts on the following dates:

New England.—1st to 28th.

Middle Atlantic states.—1st to 11th, 13th, 14th, 16th to 28th, 30th.

South Atlantic states.—1st to 4th, 8th, 9th, 10th, 13th, 16th to 28th.

Florida peninsula.—Sanford, 3d; Cedar Keys, 19th, 30th; Archer, 2d, 3d, 10th, 19th, 20th; Tallahassee, 19th; Limona, 3d; Newport, 2d, 3d, 19th, 20th, Manatee, 3d, 4th.

East Gulf states.—1st, 2d, 3d, 8th, 9th, 16th, 18th, 19th, 20th, 21st, 25th, 26th.

West Gulf states.—1st to 4th, 6th, 7th, 8th, 12th, 13th, 15th, 16th, 18th, 19th, 26th, 31st.

Tennessee.—1st to 5th, 7th to 10th, 12th, 13th, 14th, 16th to 20th, 22d to 28th, 31st.

Ohio valley.—1st to 5th, 8th, 9th, 10th, 13th, 14th, 18th, 19th, 20th, 25th, 26th, 27th.

Lower lake region.—1st to 10th, 19th, 20th, 23d, 25th, 26th, 27th.

Upper lake region.—1st to 4th, 9th to 27th, 30th, 31st.

Extreme northwest.—1st to 31st.

Upper Mississippi valley.—1st to 5th, 8th to 27th, 31st.

Missouri valley.—1st to 31st.

Northern slope.—1st to 18th, 20th to 31st.

Middle slope.—1st to 4th, 8th to 18th, 20th to 31st.

Southern slope.—1st, 2d, 3d, 7th, 9th, 11th, 12th, 15th, 16th, 17th, 19th, 20th, 21st, 25th, 26th, 27th.

Southern plateau.—1st to 31st.

Middle plateau.—1st to 6th, 8th, 10th, 11th, 28th to 31st.

Northern plateau.—1st to 18th, 27th to 31st.

North Pacific coast region.—1st to 13th, 15th.

Middle Pacific coast region.—1st to 6th, 9th to 16th, 27th, 29th, 30th, 31st.

South Pacific coast region.—Los Angeles, California, 2d, 3d, 6th, 13th to 17th; Poway, California, 1st, 2d, 3d, 14th to 17th, 30th.

#### ICE.

Ice formed at stations in the South, during December, as follows:

Jacksonville and Pensacola, Florida, 19th.

Wilmington, North Carolina, 19th.

Augusta, Georgia, 19th, 20th.

New Orleans, Louisiana, 19th.

Galveston, Texas, 18th.

Indianola, Texas, 18th, 26th.

Brownsville, Texas, 25th, 26th.

Fort Stockton, Texas, 12th, 18th, 19th, 25th, 26th.

#### PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of rainfall over the United States and Canada, for the month of December, 1884, as determined by the reports from more than seven hundred stations, is exhibited on chart iii.

In the following table are shown, for each of the geographical districts, as deduced from Signal Service observations, the average December precipitation for a series of years; the average for December, 1884, and the departures from the normal.

Average precipitation for December, 1884.

Districts.	Average for Dec. Signal-Service observations.		Comparison of Dec., 1884, with the average for several years.
	For several years.	For 1884.	
	Inches.	Inches	Inches.
New England.....	3.32	6.11	+2.79
Middle Atlantic states.....	3.42	5.55	+2.13
South Atlantic states.....	4.30	4.69	+0.33
Florida peninsula.....	2.49	3.79	+1.30
Eastern Gulf states.....	5.36	7.10	+1.74
Western Gulf states.....	3.93	9.91	+5.98
Rio Grande valley.....	1.94	0.83	-1.11
Tennessee.....	4.42	6.46	+2.04
Ohio valley.....	3.67	5.16	+1.49
Lower lake region.....	2.86	2.96	+0.10
Upper lake region.....	2.50	4.89	+2.39
Extreme northwest.....	0.92	0.99	+0.07
Upper Mississippi valley.....	1.96	4.24	+2.28
Missouri valley.....	0.78	0.82	+0.04
Northern slope.....	0.94	1.09	+0.15
Middle slope.....	0.64	1.17	+0.53
Southern slope.....	0.73	1.77	+1.04
Southern plateau.....	1.05	3.91	+2.86
Northern plateau.....	1.14	2.70	+1.56
North Pacific coast region.....	3.30	4.21	+0.91
Middle Pacific coast region.....	8.16	7.51	-0.65
South Pacific coast region.....	4.26	8.61	+4.35
Mount Washington, N. H.....	2.08	3.88	+1.80
Pike's Peak, Colo.....	5.46	4.70	-0.76
	1.24	1.50	+0.26

With the exception of the north Pacific coast region, Rio Grande valley, and at a few scattering stations in other districts, the precipitation for December has been excessive throughout the United States.

In the upper Mississippi valley, west Gulf states, southern plateau, and in the middle Pacific coast region, it has been exceptionally heavy, being more than double the average in these districts.

Decided excesses over the average also occurred in the upper lake region, New England, middle Atlantic states, Tennessee, Ohio valley, east Gulf states and Florida, the departures varying from 1.30 in Florida to 2.79 in New England. At Little Rock, Arkansas, the monthly precipitation was 16.92, or an excess of 13.40 over the December average for the four preceding years; at Shreveport, Louisiana, it was 15.55, or an excess of 10.91 as compared with the average for the last